



ADVANCED AG SYSTEMS'S

# Crop Soil News

<http://www.advancedagsys.com/>

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**"It is the crops that feed the cows that make the milk which creates the money."**

## Red Clover: Old Forage for the Modern Dairy

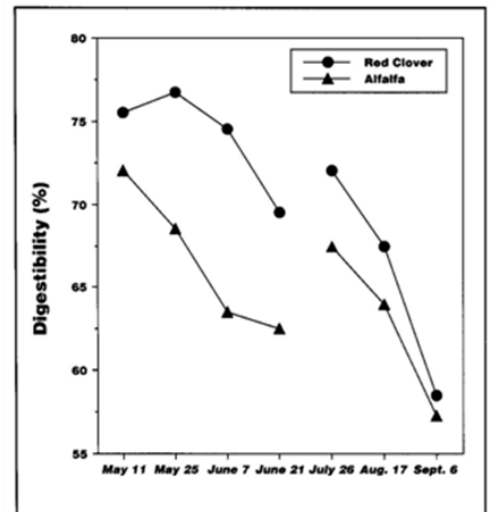
There are millions of acres from Maine to Minnesota, Canada to Virginia that, because of compromised drainage, will not support alfalfa and give erratic silage yields past the first year of corn. These soils can support clear grass but increasing nitrogen cost made the nutrients in that forage cost prohibitive.

Red clover is recommended on these soils. **Red Clover** can be summed up in the statement, **"that wet sloop my grandfather used to grow that never dries."** What our grandfather's knew and what we know now is very different.

Red clover has **feed value** equal or **exceeding alfalfa** cut at the same time (see graph from U. of Wisconsin at right). It can be harvested a little later and still have the feed quality of alfalfa harvested earlier. Thus you are opening a second window for harvest. This reduces risk in our more variable weather, as you now have two chances to get in the very high quality forage necessary to feed dairy cows a high forage diet that pushes the peak up for greater production and components throughout the entire lactation. More importantly, from a nutritional standpoint, red clover has enzymes that inhibit protein breakdown for more bypass protein, thus producing milk at a lower cost. It also contains a compound that inhibits hyper-ammonia rumen bacteria from destroying protein thus increasing the metabolizable energy for milk production. This reduces off-farm purchased protein, reducing the importation of phosphorus onto the farm and aiding in more nutrient balanced farms.

Farmers abandoned red clover because of the perception/experience that it would not dry. Alfalfa was normally mowed and left for two or three days before ensiling. Now farmers wide swath and are ensiling >35% dry matter alfalfa in two to three hours on first cutting. Preliminary work first reported in January of 2008 and then follow-up work reported February 2011 (<http://advancedagsys.com/newsletters/>) found we could also successfully make same day haylage from red clover. The **New York Farm Viability Institute** funded replicated research by Advanced Ag Systems LLC and tests were run with help from local **Extension agents and farmers** in Columbia, Delaware and Jefferson counties. We tackled this problem by adapting techniques from wide swath alfalfa. The research encompassed both 2012 and the first cut of 2013 with **4 of the 6 studies in extremely wet conditions**. Several tests had measurable rain the previous night. Due to weather delays **all first cuts were late full bloom with heavy clover**.

The first unexpected finding was that **conditioning had no effect** on reducing the time for drying to 35% dry matter. We thought the thicker, succulent stems would respond to conditioning. A replicated wide swath and a wide swath with intermeshing roll conditioning both dried at the same rate of moisture loss. This very similar to what we found in alfalfa.



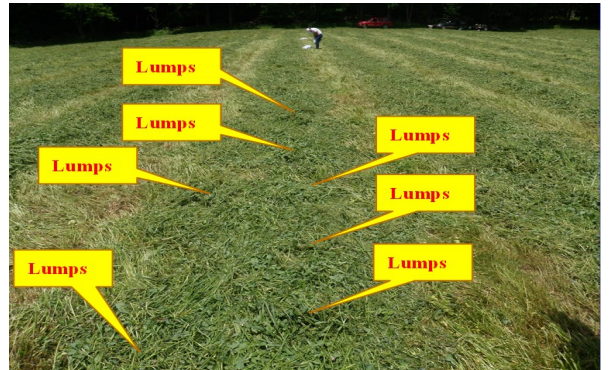
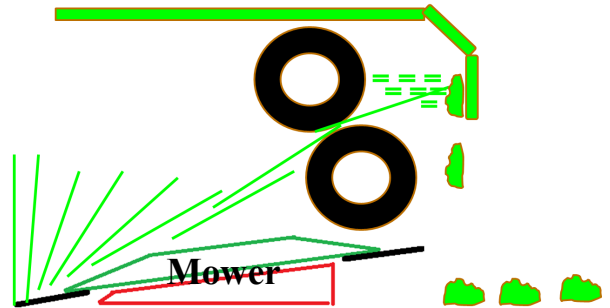
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Also similar to alfalfa was the finding was that shields present on mowers kept us from achieving a wide swath. Several only left 60% of cutterbar swath rather than the **critical >80% of cutterbar needed for same day haylage** as found in an earlier NYFVI wide swath study on alfalfa. With the slightly higher moisture in clover and the less rigidity of the stems, the edges of the narrowed swaths, which comprises >40% of the forage, were a compacted, non-drying mat on either side of the swath. Tedding sooner after mowing corrected this limitation.

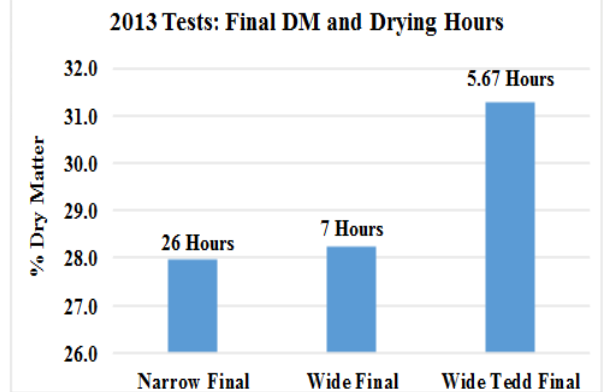
An unexpected but more **critical finding** was that the heavy first cutting clover also **impinged into a lump on the deflectors designed to make a wider swath**, and then dropped to the ground (see pictures at right). Thus on some of our tests, the wide swath was thin material interspersed with basketball sized lumps of wet clover. This dramatically inhibited drying below 75% moisture. On two farms that removed the shields, the forage could disperse unimpeded. In both cases, the swath was uniform density, dried faster and more evenly.

In all of the studies on first cutting the **narrow swaths** were not ready to **ensile (>30% dry matter)** until **24 – 30 hours after mowing**. In 5 of the 6 studies, the wide swath not tedded, was ready to ensile in 6 - 7 hours. The one wide swath-not-tedded test with excessive lumping from the deflectors dried very poorly. In all of the studies, **wide swath with tedding 2 hours** after mowing was ready to **ensile in just over 5 hours** (same day haylage). Earlier studies in more normal weather and clover cut on time the tedded treatment only required 4 hours to reach ensiling dry matter. The other experience we found was that **tedding heavy first cut** needed to be at a **slower forward speed** or it too would make **nondrying tedder lumps**, as first cutting red clover is a heavy yielding crop. The one study with lumps produced by the mower, slower forward speed tedding pulled them apart and accelerated the drying so the wide swath with tedding dried somewhat comparable to the other studies.

Red Clover can produce yields equal or exceeding alfalfa for the first two – three years. Utilized in a short rotation with no-till corn, very high yield can be achieved on soils that traditionally had not produced a reliable forage supply. The combination of wide (>80%) swath with uniform, low density swath from removal of deflectors, can produce the same or better forage on somewhat poorly drained soils as is produced by alfalfa on well drained soils.



Above: lumps formed by the mower wide swath deflector shield. Below: Removing side shields and lifting the deflector shield gave uniform, non lumped swaths that dried fast for same day haylage.



Sincerely,

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